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Pamphilius albopictus (Hymenoptera, Pamphiliidae) and its Close Relatives

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Abstract *Pamphilius albopictus* subgroup of the *P. vafer* group is defined to include three Palearctic species, i.e., *P. heecheonparki* sp. nov. occurring in East Siberia to Korea, *P. albopictus* (Thomson, 1871), probably a thelytokous species distributed in Europe to Kamchatka and Korea, and *P. kamikochensis* Takeuchi, 1930, from Japan. Based on examination of the type material, *P. albopictus* and *P. kamikochensis* are redescribed, the synonymy of *P. altaicus* Gussakovskij, 1935, with *P. albopictus* is confirmed, and *P. viridipes* Achterberg & Aartsen, 1986, described from The Netherlands is newly synonymized with *P. albopictus*. *Pamphilius albopictus* is newly recorded from Switzerland, Ukraine and Korea.

Key words: Pamphiliidae, *Pamphilius albopictus* subgroup, new species, new synonymy, Palearctic region.

Pamphilius albopictus (Thomson, 1871) is an uncommon species of leaf-rolling sawfly widely distributed in the northern part of Eurasian continent. It is one of the least known of the European species of *Pamphilius*. Thomson (1871) first described it from Sweden under the name of "*Lyda albo-picta*," but, because of its superficial resemblance to *Pamphilius vafer* (Linnaeus, 1767), André (1881) synonymized it with the latter and major taxonomic works thereafter (e.g., Konow, 1897, 1905; Enslin, 1917; Gussakovskij, 1935) followed this synonymy. Saarinen (1946), however, treated *P. albopictus* as a distinct species (see also Kontuniemi, 1947 a, b , 1960) and discovery of the host-plant of this species by Kangas (1961) and Kangas and Kangas (1965) supported his view; the larvae of *P. albopictus* feed on *Prunus padus*, whereas those of *P. vafer* on *Alnus* spp. Finally, Beneš (1976) clearly distinguished the females of the two species after studying the type material and recorded *P. albopictus* from Siberia for the first time.

Gussakovskij (1935), who regarded *P. albopictus* as synonymous with *P. vafer*, described *P. altaicus* Gussakovskij, 1935, from the Altais, and more recently, Achterberg and Aartsen (1986) described *P. viridipes* Achterberg & Aartsen, 1986, from The Netherlands. As discussed below, my examination of a series of specimens of *P. albopictus* from all parts of its distributional range as well as all the relevant types has convinced me that the two taxa are junior synonyms of *P. albopictus*.

The present paper deals with *P. albopictus* and two species closely related to it,

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P. kamikochensis Takeuchi, 1930, from Japan and *P. heecheonparki* sp. nov. occurring in East Siberia to Korea. The three species belong to the *vafer* group defined by Beneš (1976; see also Shinohara, 1988) and here they are treated as constituting a species-group of their own, the *albopictus* subgroup of the *vafer* group. The species of the *albopictus* subgroup may be distinguished from the other members of the *vafer* group by having a series of specialized, apically truncate or rounded setae on the saw-sheath. The larvae of *P. albopictus* and *P. kamikochensis*, and possibly also those of *P. heecheonparki*, feed on cherry trees of the subgenus *Padus*.

All the specimens used in this work are kept in the National Science Museum, Tokyo, unless otherwise stated. The following abbreviations are used in the text for the depositories of the loaned material: BMNH – The Natural History Museum, London; CIS – Center for Insect Systematics, Kangwon National University, Chuncheon; DEI – Deutsches Entomologisches Institut, Eberswalde; EWU – Ewha Womans University, Seoul; HNHM – Hungarian Natural History Museum, Budapest; HU – Hokkaido University, Sapporo; IBPV – Institute of Biology and Pedology, Vladivostok; KNU – Kyungpook National University, Taegu; KU – Kobe University, Kobe; LU – Museum of Zoology, Lund University, Lund; MA – M. Abe collection, Kumamoto; NML – National Museum of Natural History, Leiden; OMNH – Osaka Museum of Natural History, Osaka; SMNH – Swedish Museum of Natural History, Stockholm; SNU – Seoul National University, Suwon; UOP – University of Osaka Prefecture, Sakai; ZISP – Zoological Institute, St. Petersburg; ZMUM – Zoological Museum, Moscow State University, Moscow.

Subgroup of *Pamphilius albopictus*

Beneš (1976) characterized the *vafer* group by the flat or only slightly convex frons without sharp crests, subparallel inner orbits, more or less pilose vertex, bidentate right mandible, well developed postgenal carina, pale hind femur, and apically bulbous or widened, anchor-like penis valves. The three species of the *P. albopictus* subgroup further share the following features: anterior margin of clypeus medially broadly produced and apically truncate or even slightly concave; oblong spot along outer margin of lateral suture usually present; frontal area between the level of transverse suture and the level of antennal sockets coarsely rugosely punctate, interspaces almost linear; mesoscutal median lobe (except for anterior margin) and mesoscutellum pale; mesepisternum and metepisternum largely pale at least laterally; cell C of forewing pilose or glabrous; stigma unicolored, sometimes marginally or basally darkened, but two colors never sharply demarcated; abdomen with orange area above. Females: Clypeus mostly pale; postocular stripe broad, with anterior extension along inner orbit; pale area on paraantennal field usually restricted to orbital margin; antenna with 3rd segment about 1.8–2.6 times as long as 4th; scape black, sometimes largely pale-marked; mesoscutal lateral lobe often pale-marked; apical margin of

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sawsheath with thick, apically rounded, truncate, or serrate setae (Fig. 8 C, E–F); sawsheath peg slender (Fig. 8 B, E; see also remarks under *P. albopictus*); pale coloration sometimes with greenish tint. Males: Antenna with 3rd segment about 1.7–2.3 times as long as 4th, apically oblique; genitalia with inner margins of gonostipes divergent toward apex (Fig. 9 A, D).

The following three species are included (Fig. 1 shows their distribution in eastern Asia):

P. heecheonparki sp. nov.	East Siberia to Korea
P. albopictus (Thomson, 1871)	Europe to Kamchatka and Korea
P. kamikochensis Takeuchi, 1930	Japan

The thick, apically rounded, truncate, or serrate setae on the sawsheath are an apparently specialized feature. Achterberg and Aartsen (1986) mentioned that this character was unique to their new species, *P. viridipes*, but in fact these specialized setae are found in the three species belonging to the *albopictus* subgroup. More or less similar specialized setae occur in some species of the *sylvaticus* group (at least in *P. sylvaticus* (Linnaeus, 1758) and *P. volatilis* (Smith, 1874)), many of which are associated with arborescent Rosaceae. However, apart from this similarity (and perhaps the host-plant relationship as noted below), there is no evidence suggesting the close relationship between the *P. albopictus* subgroup and the *P. sylvaticus* group.

Another important feature of the species of the *albopictus* subgroup is their host-plants. The larva of *P. albopictus* feeds on *Prunus padus* and that of *P. kamikochensis* feeds on *P. ssiori*, both solitarily making a non-specialized leaf-roll. *Prunus padus* and *P. ssiori* are closely related cherry trees of the subgenus *Padus*. The larva of *P. heecheonparki* is unknown, but many of the adults examined have been collected on the leaves of *Prunus* (*Padus*) sp. in Korea and the Russian Far East, suggesting a high possibility that the larva actually feeds on this group of cherry trees. The only other species of *Pamphilius* known to feed on *Padus* is *P. sylvaticus* (Linnaeus, 1758), a European species whose larva gregariously feeds on *Prunus* (*P. padus*, *P. domestica*, *P. spinosa*), *Crataegus* and *Sorbus*.

Within the *albopictus* subgroup, two allopatric forms, *P. albopictus* and *P. kamikochensis*, are most closely related as discussed under the former species, and *P. heecheonparki* is somewhat isolated, showing apparently derived character states in the sawsheath peg and penis valve.

Key to the species

1. Female 2
— Male (unknown for *P. albopictus*) 4
2. Sawsheath peg (Fig. 8 B) stout, cylindrical or dorsally slightly convex in lateral view, glabrous (with a few microscopic sensilla at apex). [Head color pattern as in Fig. 3 E–F (black area between lateral suture and upper inner orbit always

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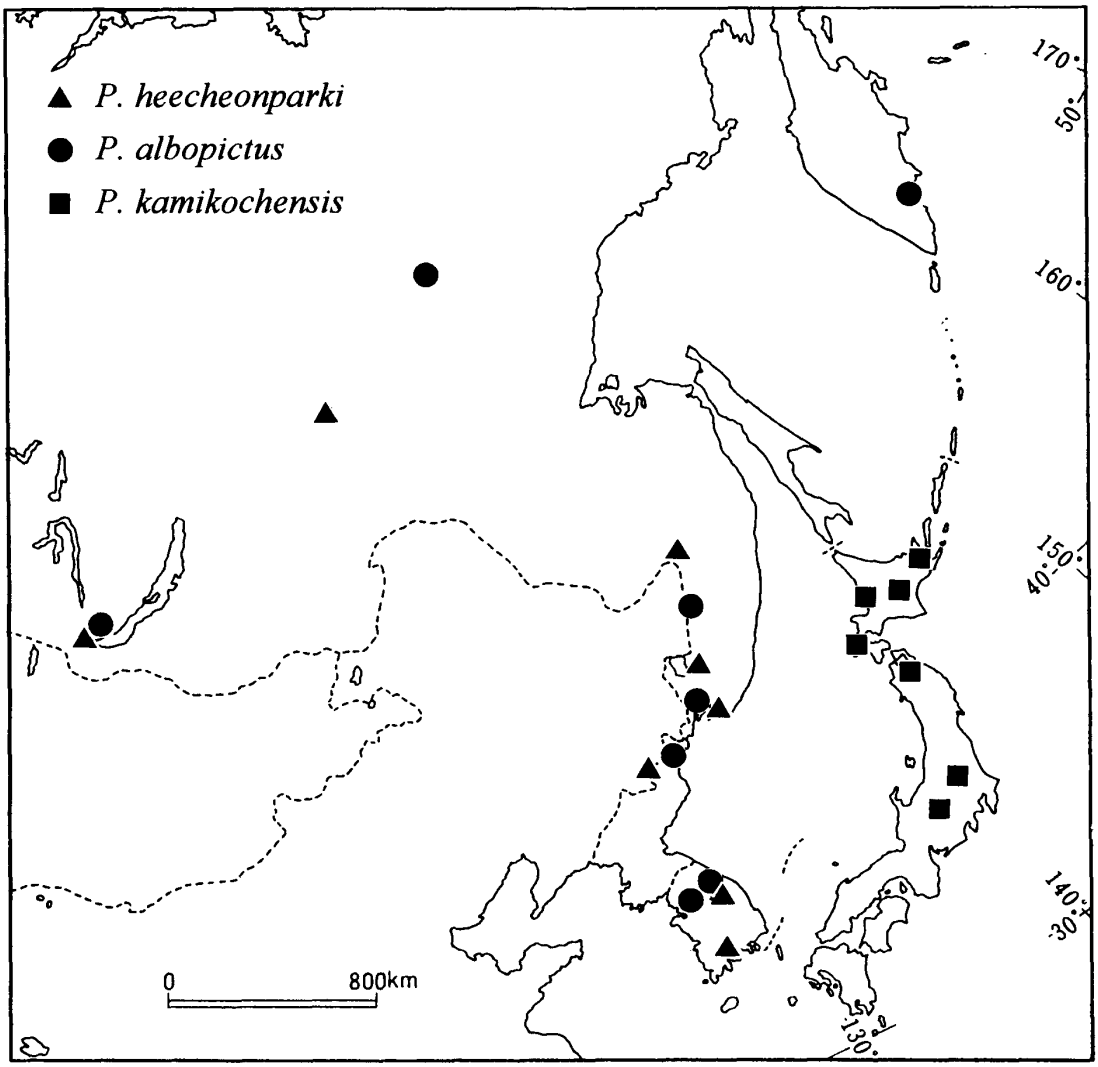

Fig. 1. Distribution of three species of the *P. albopictus* subgroup in northeastern Asia. Only peripheral localities are shown in Primorskij kraj, Korea and Japan. One collecting site for *P. heecheonparki*, "c. Padun' na V. Tungusky, Irk.," is not plotted, because it was not located on the map with certainly; it may be "Padun" about 25 km north of Bratsk.

large and distinct; postocellar area usually with oblong spot along each lateral margin; pale mark on gena variable, usually large and connected with posterior end of supraocular stripe, but sometimes reduced and not connected with it); posttergite never pale-marked; mesoscutal lateral lobe usually with oblong pale spot adjacent to median lobe and another larger spot anterolateral to mesoscutellum; stigma dark brown, often with apical half somewhat paler (Fig. 7 A); dorsum of abdomen with 3rd to 5th segments (sometimes also median parts of 2nd and 6th segments) largely orange (Fig. 2 A)] ..... *P. heecheonparki*

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— Sawsheath peg (Fig. 8 E) elongate subtriangular in lateral view, setose.....3

3. Head color pattern as in Fig. 4, usually with large pale areas (black area between lateral suture and upper inner orbit sometimes reduced; postocellar area often with oblong spot along each lateral margin; most of gena pale and this pale area almost always connected with posterior end of supraocular stripe); posttergite often pale-marked; mesoscutal lateral lobe usually with oblong pale spot adjacent to median lobe and another larger spot anterolateral to mesoscutellum; stigma pale brown, often with darkened margins (Fig. 7 B–D); dorsum of abdomen usually with 3rd (or 2nd) to 8th (or 9th) segments largely orange (Fig. 2 E, I) ..... *P. albopictus*

— Head color pattern as in Fig. 5 A–D, with small pale areas (black area between lateral suture and upper inner orbit always large and distinct; postocellar area usually without oblong spot along each lateral margin; pale mark on gena usually restricted to ventral part, sometimes missing, and rarely connected with posterior end of supraocular stripe); posttergite never palemarked; mesoscutal lateral lobe usually without pale marks; stigma dark brown (Fig. 7 E); dorsum of abdomen usually with only 3rd to 5th segments largely orange (Fig. 3 A) ..... *P. kamikochensis*

4. Genitalia as in Figs. 9 A–C, 10 A, C; harpes elongate, narrow; penis valve short, anchor-like; pseudosternum usually largely pale yellow (Fig. 2 D)..... ..... *P. heecheonparki*

— Genitalia as in Figs. 9 D–F, 10 B, D; harpes broad; penis valve very long, bent in lateral view, roundly widened at apex in dorsal view; pseudosternum usually largely black (Fig. 3 D) ..... *P. kamikochensis*

Pamphilius heecheonparki sp. nov.

(Figs. 2 A–D, 3 E–H, 7 A, 8 A–C, 9 A–C, 10 A, C)

?*Pamphilius albopictus* (melanic form): Beneš, 1976, p. 161.

Female (holotype; Figs. 2 A–B, 3 E–F, 7 A). Length ca. 10 mm. Head black, with the following pale yellow: most of clypeus, very broad postocular stripe posteriorly reaching hind margin of head and anteriorly extending along inner orbits to malar space (but not connected to clypeal pale area), oblong spot at each lateral margin and crescent-shaped spot at posterior margin of postocellar area, large, elongate spot along outer margin of each lateral suture, malar space (except anterior ventral part), and most of gena; mandible pale yellow, with inner half black and apex rufous; antennal scape and pedicel black, with ventral (outer) surface pale yellow; flagellum with a few basal segments ventrally brown and dorsally blackish brown, and the rest blackish brown becoming more blackish toward apex. Thorax black with the following pale yellow: most of lateral pronotum, broad posterior margin of dorsal pronotum

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(medially interrupted), large spot on ventral surface of cervical sclerite, tegula, posterior half of mesoscutal median lobe, elongate spot in anterior part of mesoscutal lateral lobe along lateral margin of median lobe, subtriangular spot in median part of mesoscutal lateral lobe anterolateral to mesoscutellum, mesoscutellum, very large spot covering most of lateral part of mesepisternum, metascutellum, most of lateral part of metepisternum, round spot in dorsal part of metepimeron. Legs pale yellow, with narrow coxal bases black. Wings hyaline, slightly brownish; stigma dark brown, somewhat paler in apical half; veins in forewing dark brown to blackish, with entire C, Sc, and veins in its basal part very pale brown. Abdomen black, with narrow median part of 2nd, large median parts of 3rd to 5th, and very narrow posteromedian part of 6th terga orange, and very narrow lateral margins of dorsal surface, very narrow posterior margins of 6th to terminal terga, all laterotergites (except for very narrow black area around spiracles), narrow posterior margin of 2nd, posterior 1/2–2/3 of each of the remaining sterna, and caudal part including sawsheath pale yellow.

Upper frons below ocelli roundly, weakly convex, without distinct median notch reaching median fovea; ocellar basin shallow and inconspicuous, represented by shallow furrow around median ocellus, without distinct anterolateral extension; median fovea indistinct; frontoclypeal crest low, rounded, in lateral view, very slightly lowered at frontoclypeal suture; facial crest rounded. Upper part of head behind transverse and lateral transverse sutures with rather sparse, irregular, often large and deep punctures, interspaces rather smooth; area from these sutures to dorsal halves of paraantennal field and frons covered with very dense, coarse, deep, rugosely confluent punctures; ventral parts of paraantennal field and frons somewhat coriaceous, with rather sparse punctures; clypeus covered with rather dense, deep, large punctures, interspaces smooth or weakly coriaceous; malar space and gena rugose and irregularly punctate; head before crassa pilose all over. Antennae 21-segmented, with 3rd segment about 2.1 times as long as 4th. Tarsal claw with rounded basal lobe and inner tooth distinctly shorter than outer one. Forewing with cell C glabrous. Sawsheath as in Fig. 8 A–C, with stout, apically rounded setae; peg stout, cylindrical or feebly swollen above, glabrous (with a few microscopic sensilla at apex).

Male (paratopotype, Figs. 2 C–D, 3 G–H). Length ca. 9 mm. Head black, with anterior part before line connecting facial crests, most of frons, broad postocular stripe, elongate spot along outer margin of lateral suture, malar space and most of gena pale yellow; mandible as in female; antennal scape pale yellow, with dorsal surface black, pedicel black, with outer ventral surface pale yellow, and flagellum dark brown, dorsally distinctly blackish. Thorax black with the following pale yellow: most of lateral pronotum, posterolateral corner of dorsal pronotum, ventral part of cervical sclerite, tegula, posterior half of mesoscutal median lobe, mesoscutellum, mesepisternum except for very narrow dorsal and ventral margins and subtriangular spot at ventroposterior margin, minute spot at dorsal margin of and very narrow posterior margin of mesepimeron, metascutellum, most of lateral surface of metepister-

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num, large mark covering posterodorsal half of metepimeron. Legs and wings as in female. Abdomen black dorsally, with narrow lateral margin yellow and narrow subtriangular spot at posterior margin of 3rd segment and large median spot on each of 4th and 5th segments orange, and yellow ventrally, with base of 2nd sternum black.

Structure similar to that of female, but facial crest slightly more developed, bluntly carinate. Antennae 21-segmented, with 3rd segment about 1.8 times as long as 4th. Forewing with cell C rather sparsely pilose all over. Subgenital plate with apical margin broadly rounded. Genitalia as in Figs. 9 A–C, 10 A, C.

Distribution. Eastern Siberia, Russian Far East, Korea.

Holotype: ♀, Huibangsa, 750 m, Mt. Sobaeksan, Kyongsangbuk-do, Korea, 19. V. 1987, A. Shinohara. Deposited in the College of Natural Sciences, Kyungpook National University, Taegu.

Paratypes: **RUSSIA**: **Irkutskaya oblast'**: 1♂, "Dachnaya 32 km Yu Irkutska, pojma, Kasparyan, 11. VI. 75" (ZISP); 1♀, "98177," "c. Padun' na V. Tungusky, Irk., Chekanovskij, 67" (ZISP). **Jakutiya**: 1♂, "Yakutiya r. Chara, c. Tokko, 60 km YuZ Olekminska, Bagachanova, 6. 06. 980" (ZISP). **Khabarovskij kraj**: 1♀, "Chabarovsk, on *Padus*, 15. V. 1968, A. Shtundyuk" (ZMUM); 1♂, "Bytschicha, S. Chabarovsk, 15. V. 1968, A. Shtundyuk" (ZMUM). **Primorskij kraj**: 1♀, "Primorskij kraj, Spassk. distr. Tatyanovka, Kuznezov, 16. IX[!]. 1970" (ZMUM); 1♀, "Nikolaevka, Primorskij kr., Lelej, 9. V 1981" (IBPV); 1♂, "Vinogradovka, Ussur. Kr., 26. V. 929, D'yakonov Filip." "*P. albopictus* Ths. ♂, det. K. Beneš, 1970," "*Pamphilius* n. sp. det. A. Shinohara, 1995" (SMNH); 1♂, Valley of Tigrovaya River, 180 m, 12 km N of Partizansk, 7. VI. 1994, A. Shinohara; 4♂, 6 km E of Okeanskaya Station, Vladivostok, 9–10. VI. 1994, A. Shinohara; 4♀, 4♂, Anisimovka, 300 m, 21. V. 1995, A. Lelej; 1♀, 1♂, Tigrovoj, 300 m, 5. VI. 1995, A. Shinohara; 2♂, same locality and date, A. Lelej; 1♀, "Yuzh.-Ussurijs. Kraj, st. Sedanka, 28. V. 1915, A. [?]" (ZISP). **KOREA**: 1♂, "Korea, Paekdusan, Sam Jion," "VI. 20. 1990, leg. Han Eng Hi," "Sam Chi-Yon [in Hangul], 1990. 6. 20" (HNHM); 1♀, "1972. 5. 6, Myongjisan [Kyonggi-do], Lee Yong Sun" (EWU); 22♀, 2♂, Mirugam (Puktaesa), 1,300 m, Mt. Odaesan, Kangwon-do, 9–11. VI. 1987, A. Shinohara; 15♀, 78♂, same locality and collector, 18–28. V. 1989; 1♀, 16♂, same locality and collector, 13–16. V. 1990; 12♀, 30♂, same locality and collector, 28. V. –2. VI. 1991; 3♀, 28♂, same locality and collector, 28–31. V. 1992; 1♀, 17♂, same locality and collector, 27–31. V. 1993; 1♀, 9♂, same locality and collector, 29. V. –1. VI. 1996; 2♂, same locality and collector, 6. VI. 1996; 1♂, same locality, 29. V. –1. VI. 1996, J.-W. Kim (SNU); 1♂, same locality, 6. VI. 1996, J.-W. Kim (SNU); 2♀, 28♂, same locality, 31. V. –7. VI. 1997, A. Shinohara; 2♀, 12♂, same locality, 31. V. –6. VI. 1997, J.-W. Kim (SNU); 1♀, 3♂, Sangwonsa, Mt. Odaesan, Kangwon-do, 12. V. 1990, A. Shinohara; 4♀, Chin-kogae, 850 m, Mt. Odaesan, Kangwon-do, 1–2. VI. 1992, A. Shinohara; 1♀, Chin-kogae, 850 m, Mt. Odaesan, Kangwon-do, 26. V. 1993, A. Shinohara; 39♀, 56♂, same locality and collector as for holotype, 16–21. V. 1987; 10♀, 17♂, Popkyesa, 1,300 m, Mt. Chirisan, Kyongsangnam-do, 25–

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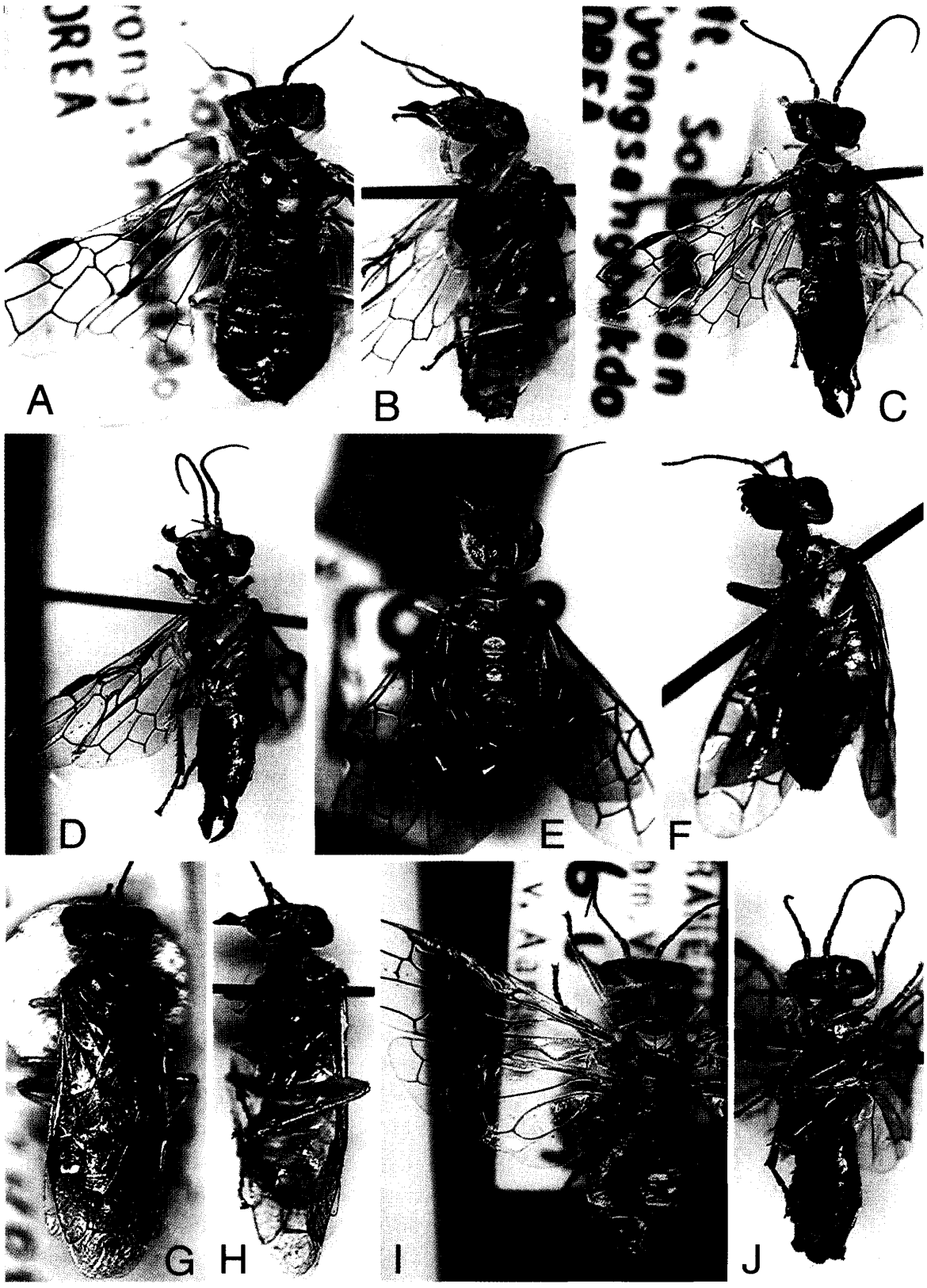

Fig. 2. Type specimens of *Pamphilius* spp. —— A–B, *P. heecheonparki* sp. nov., ♀, holotype; C–D, do., ♂, paratopotype; E–F, *P. albopictus* (Thomson), ♀, lectotype of *Lyda albo-picta* Thomson; G–H, do., ♀, holotype of *P. altaicus* Gussakovskij; I–J, do., ♀, holotype of *P. viridipes* Achterberg & Aartsen.

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29. V. 1987, A. Shinohara.

Variation. Females: Length varies from 8.5 mm to 11 mm. The 92 intact antennae examined have 19 to 23 segments (Fig. 6 A). The ratio of the lengths of the 3rd to 4th antennal segments in 50 specimens measured varies from 1.8 to 2.4 (Fig. 6 B). Variations in color pattern are noted in the key. Males: Length varies from 7 mm to 10.5 mm. The 98 intact antennae examined have 19 to 22 (one exceptionally 17) segments (Fig. 6 C). The ratio of the lengths of the 3rd to 4th antennal segments in 50 specimens measured varies from 1.7 to 2.2 (Fig. 6 D). The color pattern is fairly stable in general. The pale oblong spot along outer margin of the lateral suture is often missing in Russian specimens. The lateral lobe of the mesoscutum sometimes has a small spot along the lateral margin of the median lobe and/or another minute spot anterolateral to the mesoscutellum. The pseudosternum of the mesothorax is sometimes largely marked with black. The orange area on the abdomen sometimes becomes reduced to an obscure small spot on each of the 3rd to 5th terga, whereas the palest specimen examined (from Irkutsk region) has the 3rd to 5th terga mostly and posterior margin of the 6th tergum broadly orange.

Etymology. I take pleasure in naming this species after Prof. Hee-Cheon Park, Kyungpook National University, Taegu, who greatly helped me during my trip to Mt. Chirisan and Mt. Sobaeksan in Korea in 1987, where I collected my first specimens of this species.

Host-plant. Unknown. Many of the specimens I collected in Korea and Primorskij kraj were obtained from the leaves of *Prunus* (*Padus*) sp., which may represent the host-plant.

Remarks. Pamphilius heecheonparki closely resembles dark specimens of *P. albopictus* or pale specimens of *P. kamikochensis*, but the characteristic shape of the sawsheath peg (Fig. 8 A–B) and the anchor-like penis valve (Figs. 9 A–C, 10 A, C) will readily distinguish the new species. The distribution range of the new species is mostly included in that of *P. albopictus* (Fig. 1), and actually they have been collected together at some localities in Korea.

Beneš (1976, Figs. 3–4) illustrated a very dark head of the "melanic form" of *P. albopictus* from "Baikal, B. Glubokaya." I was not able to examine such a dark specimen of *P. albopictus*, though my material of that species includes two specimens from "Baikal, B. Glubokaya." The illustration may better agree with very dark specimens of *P. heecheonparki*. Re-examination of Beneš's material is necessary to understand the identity of this "melanic form of *P. albopictus*."

Pamphilius albopictus (Thomson, 1871)

(Figs. 2 E–J, 4, 7 B–D)

Lyda albo-picta Thomson, 1871, p. 312.

Lyda albopicta: André, 1881, p. 63 (syn. of *L. depressa* [=*P. vafer*]); Konow, 1905, p. 11 (syn. of *P. de-*

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pressus [=*P. vafer*]).

Pamphilius albopictus: Kirby, 1882, p. 337; Konow, 1897, pp. 25, 31 (syn. of *P. depressus* [=*P. vafer*]); Enslin, 1917, p. 646 (syn. of *P. depressus* [=*P. vafer*]); Klima, 1937, p. 66 (syn. of *P. vafer*); Saarinen, 1946, p. 118; Kontuniemi, 1947 a, p. 129; Kontuniemi, 1947 b, p. 181; Hellén, 1955, p. 108 (syn of *P. depressus* [=*P. vafer*].); Kontuniemi, 1960, p. 63; Kangas, 1961, p. 69; Kangas & Kangas, 1963, p. 267; Kangas & Kangas, 1965, p. 31; Lindqvist, 1969, p. 39; Beneš, 1976, p. 160; Midtgaard, 1987, 129; Midtgaard, Lomholdt & Koch, 1987, p. 36; Beneš, 1989, p. 14; Liston, 1995, p. 33; Zhelochovtsev & Zinovjev, 1995, p. 397.

Pamphilius vafer: Malaise, 1931, p. 63 (nec Linnaeus, 1767; partim).

Pamphilius altaicus Gussakovskij, 1935, p. 187; Beneš, 1976, p. 160 (syn. of *P. albopictus*).

Pamphilius viridipes Achterberg & Aartsen, 1986, p. 45; Pesarini, 1990, p. 174; Shinohara & Taeger, 1990, 95; Liston, 1995, p. 34. **Syn. nov.**

Female (lectotype; Figs. 2 E–F, 4 A–B, 7 B). Length ca. 9 mm. Head black, with extensive pale yellowish marking as in Fig. 4 A; mandible pale yellow, with inner half brown and apex rufous; antennal scape and pedicel blackish brown, with outer and much of dorsal surfaces pale yellow; flagellum dark brown becoming blackish toward apex. Thorax black with the following pale yellow: most of lateral pronotum and broad posterior margin of dorsal pronotum (almost interrupted at middle), all pale areas on pronotum fused along posterior margin, ventral surface of cervical sclerite, tegula, posterior half of mesoscutal median lobe, elongate spot in anterior part of mesoscutal lateral lobe along lateral margin of median lobe, subtriangular spot in median part of mesoscutal lateral lobe anterolateral to mesoscutellum, mesoscutellum, large spot on posttergite, very large spot covering most of lateral part of mesepisternum, large spot at dorsal margin and elongate spot along posterior margin of mesepimeron, metascutellum, entire lateral part of metepisternum, metepimeron (except for ventral margin). Legs pale yellow, with very narrow coxal bases (partly interrupted) black. Wings hyaline; stigma pale brown, with anterior and posterior margins somewhat darkened; veins in forewing dark brown to blackish, with entire C, Sc, and veins in its basal part very pale brown. Abdomen orange above and pale yellow beneath; propodeum (except for narrow posterior margin), irregular marking along anterior margins of 2nd and 3rd terga, anterior half of 2nd sternum, lateral spot at anterior margin of each sternum and anteromedian part of hypopygium black; narrow lateral margin of dorsum and posterior margin of each tergum more or less pale yellowish; posteromedian part of hypopygium and sawsheath brownish.

Upper frons below ocelli nearly flattened, without distinct median notch reaching median fovea; ocellar basin represented by furrow around median ocellus and shallow depression in front of median ocellus, without distinct anterolateral extension; median fovea indistinct, but with swelling just above it; frontoclypeal crest low, rounded, in lateral view, slightly lowered at frontoclypeal suture; facial crest low, rounded. Upper part of head behind transverse and lateral transverse sutures with rather sparse, irregular, often large and deep punctures, interspaces rather smooth; area from these sutures to dorsal halves of paraantennal field and frons covered with

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very dense, coarse, deep, rugosely confluent punctures; ventral part of paraantennal field rather smooth or weakly coriaceous, nearly impunctate; ventral part of frons and all clypeus covered with rather dense, deep, large punctures, interspaces smooth or weakly coriaceous; malar space and gena rugose and irregularly punctate; head before crassa pilose all over. Antennae 19-segmented, with 3rd segment about 2.2 times as long as 4th. Tarsal claw with rounded basal lobe and inner tooth distinctly shorter than outer one. Forewing with cell C rather densely pilose. Sawsheath somewhat damaged (see discussion below), with at least one stout, apically rounded seta ventrally; peg subconical.

Male. Unknown.

Distribution. Northern, central and eastern Europe (Sweden, Norway, Denmark, Finland, Scotland, The Netherlands, Germany, Switzerland [new record], Austria, Czech, Ukraine [new record], Russia) across Siberia to Kamchatka and Primorskij kraj, and Korea [new record].

Type specimens examined. ♀ (lectotype of *Lyda albo-picta* Thomson, 1871) labeled "♀," "Fglsnj 30. 6. 38," "ant 19-artii," "*L. depressa*," "1969, 2681," "LECTOTYPE," "*P. albopictus* Ths., ♀, det. K. Beneš, 1970," "1984, 412," "ZML. 1997, 649" (LU); ♀ (holotype of *Pamphilius altaicus* Gussakovskij, 1935) labeled [gold circle], "Altaj v gorakh, 11. VI. 09, Emel'yanov," "*Pamphilius altaicus* m., typus unic. ♀, Gussakovskij det.," "*Pamphilius albopictus* Ths., det. K. Beneš, 1972" (ZISP); ♀ (holotype of *Pamphilius viridipes* Achterberg & Aartsen, 1986) labeled "Kranenburg, Gem. Vorden Gld, 16. V. 1984, B. von Aartsen," "♀, *Pamphilius viridipes* sp. nov., C. v. Achterberg, 1984, holotype" (NML).

Other specimens examined. **SWEDEN**: 1♀, "Hlm [=Stockholm], "Bhn," "*L. albopicta*," "*Pamphilius albo-picta* [sic] Th.," "Det. Thomson," "Type." (SMNH); 1♀, "8/c," "Rodga [about 10 km north of Norrköping]," "*albopicta*" (SMNH). **FINLAND**: 1♀, "Finland, N. Helsinge, 31. 5. 1962, Lindquist," "*Pamphilius albopictus* Thomson" (BMNH); 1♀, "Suomi EH: Luopioinen, ex ovo 18. 5. 1966, leg. J. Kangas / *Prunus padus*." **SCOTLAND**: 1♀, "Aviemore, 13. V. 1944, P. Harwood", "*Alnus*", "*Pamphilius*? dark form of *vafer* L. (=*depressus*) or sp. nov., dark antennae!! det. R. B. Benson, 1944" (BMNH); 1♀, "Aviemore, 19. VI. 1944, P. Harwood" (BMNH). **GERMANY**: 1♀, "Erzgebirge, Lange," "sp. aff. *viridipes*," "*Pamphilius* sp. nov. ♀, nr. *viridipes* v. A. & v. A., C. v. Achterberg, 1986" (DEI); 1♀, "Erzgebirge, Lange," "*Pamphilius viridipes* Achterberg, ♀, det A. Taeger, 86," "*Pamphilius viridipes* v. A. & v. A., C. v. Achterberg, 1986" (DEI). **SWITZERLAND**: 1♀, "Bâle, W. Schmid," "*P. depressus* Sch. var." (BMNH). **CZECH**: 1♀, "26/5," "Czechoslovakia: Bohemia, Chodou, R. von Stein Coll. B. M. 1935-271" (BMNH). **UKRAINE**: 1♀, "Poltawa," *Pamphilius pallipes* Zett. ab. *prasinipes* m., typus, D. Dovnar det." (ZMUM). **RUSSIA**: 1♀, "[?], 11. V. 90," "k. A. Jakovleva," "*Pamphilius albopictus* (Thomson) Zinovjev det. 1984." **Moskovskaya oblast'**: 1♀, "[?], pr. Moskva, 19. V. 933, Zhelochovtsev" (ZMUM). **Leningradskaya oblast'**: 1♀, "Leningradskaya obl., Vir, Zinov-

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jev, 31. VI. 1972," "U rug'ya na geremukhe" (ZISP). **Chelyabinskaya oblast'**: 1 ♀, "Ilmensk. Gos. z-k., Chelyab. ob., Miassk D, kv. 188 3/VI 1944g, W Stepanov leg." (ZMUM); 1 ♀, "Ilmensk. Gos. z-k., Chelyab. ob., Miassk D, kv. 189 3/VI 1944g, W Stepanov leg." (ZISP). **Irkutskaya oblast'**: 1 ♀, "Irkutsk. obl., Shelekhovskij r-n., d. B. Glubokaya, [?] 171, s *Padus*, zhiyado, 11. VI., B. Verzhutskij, 9. VI. 69," "*Pamphilius pallipes* (Zett.) ♀, B. Verzhutskij det. 1969"; 1 ♀, "Irkutsk. obl., Shelekhovskij r-n., d. B. Glubokaya, [?] 165, s *Spiraea media*, zhiyado, 11. VI., B. Verzhutskij, 9. VI. 69," "P*amphilius pallipes* (Zett.) ♀, B. Verzhutskij det. 1969"; 2 ♀, "Dachnaya 32 km Yu Irkutska, pojma, Kasparian, 11. VI. 75" (ZISP). **Jakutiya**: 1 ♀, "Tsentr. Yakutiya, s. Elanskoe, 60 km Yuz Pokrovska, [?], Vinokurov, 23. VI. 979" (ZISP). **Kamchatskaya oblast'**: 3 ♀, "Kamtschatka, Malaise," two labeled "*P. albopictus* Ths., det. K. Beneš, 1970" and the other labeled "*P. albopictus* Ths., det K. Beneš, 1975" (SMNH). **Khabarovskij kraj**: 1 ♀, "Khabar. kr., r. Shevki, 15 km S Bikin, Kasparian, 2. VI. 1983" (ZISP). **Primorskij kraj**: 1 ♀, "Primorsk. kr. Khasan r-n., Zanadvorovka, 3. VI. 1972, A. Rasnitsyn" (ZMUM); 1 ♀, "Prim. kraj, 22. V. 1962g, Kol. Gavrmyuva" (IBPV); 1 ♀, "Suputinsk. Zapov. [=Ussurijskij Reserve], DVK., 29. VI. 87, E. Shestoperov" (ZISP); 1 ♀, Ussurijskij Reserve, 9–12. VI. 1995, P. Nemkov; 1 ♀, Anisimovka, 300 m, 3. VI. 1995, A. Lelej. **KOREA**: 1 ♀, "23. VII. 1935, Tonai [=Tonae, Hamgyongbuk-do], Takeuchi" (UOP); 3 ♀, Mirugam (Puktaesa), 1,300 m, Mt. Odaesan, Kangwon-do, 10. VI. 1987, A. Shinohara; 2 ♀, same locality and collector, 19–21. V. 1989; 3 ♀, same locality and collector, 29. V.–1. VI. 1991; 3 ♀, same locality and collector, 29–31. V. 1992; 1 ♀, same locality and collector, 1. VI. 1993; 3 ♀, same locality and collector, 29. V.–1. VI. 1996; 1 ♀, same locality, 29. V.–1. VI. 1996, J. W. Kim (SNU); 1 ♀, same locality, 6. VI. 1997, J. W. Kim (SNU); 1 ♀, same locality, 7. VI. 1997, A. Shinohara; 1 ♀, Chin-kogae, 850 m, Mt. Odaesan, Kangwon-do, 2. VI. 1992, A. Shinohara; 1 ♀, "1974. 5. 18, Mt. Chonggyesan, [Kyonggi-do], Ko In-Suk" (EWU); 5 ♀, Huibangsa, 750 m, Mt. Sobaeksan, Kyongsangbuk-do, 18–20. V. 1987, A. Shinohara.

Variation. Length varies from 8 mm to 10.5 mm. The 76 intact antennae examined have 12, 15 and 18 to 22 segments (Fig. 6 A), the first two (12 and 15) being apparently abnormal. The ratio of the lengths of the 3rd to 4th antennal segments in 49 specimens measured varies from 1.9 to 2.6 (Fig. 6 B). The coloration of this species is rather variable (see also descriptions given in the key). Table 1 shows the variation in eight characters, seven of which were used to separate *P. albopictus* and *P. viridipes* by Achterberg and Aartsen (1986). The lectotype of Thomson described above is one of the palest examples available in having extensive pale area on the head and thorax, and a few European specimens are quite similar to it. As Beneš (1976) noted, East Asian specimens tend to be darker and has the cell C of forewing sparsely pilose or glabrous. Several darkest specimens from East Asia have the elongate spot along each lateral margin of the postocellar area and paired spots on each mesoscutal lateral lobe entirely missing. On the other hand, the pale coloration of the

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Table 1. Individual variations of eight characters (A–H) in 59 specimens of *P. albopictus* and holotypes of *P. kamikochensis* and *P. heecheonparki*: 1, lectotype of *Lyda albo-picta*; 2, holotype of *P. altaicus*, 3, holotype of *P. viridipes*, 4–59, specimens of *P. albopictus* listed in the "Other specimens examined" section in the same order; 60, holotype of *P. kamikochensis*; 61, holotype of *P. heecheonparki*.

Characters	Specimens															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
A	0	0	1	0	0	0/1	0	0	0	0	0	0/1	0/1	0	0/1	0
B	–	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
C	–	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
D	0	0/1	1	0	0	1	0/1	0	0	1	0/1	1	0	1	0	1
E	0	0	1	0	0/1	0	1	1	0	1	0/1	0	1	1	0	1
F	0	1	1	0	0	1	1	1	1	1	0	1	1	0	0	1
G	0	0	1	0	0	0	0	0	0	1	0	0	0	1	0	0
H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
A	0	0	0	0	0	0/1	0	0/1	0/1	0/1	0/1	1	0/1	–	1	1
B	1	1	1	1	1	1	1	1	–	1	1	1	1	1	1	1
C	1	1	1	1	1	1	1	1	–	1	1	1	1	1	1	1
D	1	0	0/1	1	1	1	1	1	1	1	1	1	1	1	1	0/1
E	0	0/1	0	0/1	1	1	1	0/1	1	1	1	1	1	1	1	0/1
F	1	0	0	1	1	1	1	1	1	1	1	1	1	–	1	1
G	1	0	1	0	0	0	0	1	0	0	0	0	0	1	0	0
H	0	0	0	0	0	0	0	0	0	0	0	0	0	–	0	0
	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48
A	0/1	0	0/1	0/1	0/1	1	0/1	1	1	1	1	0/1	1	1	0/1	1
B	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
C	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
D	1	1	1	1	1	1	1	1	0/1	0/1	1	1	1	0/1	1	1
E	1	0/1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
F	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
G	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	1
H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	49	50	51	52	53	54	55	56	57	58	59	60	61			
A	0/1	0/1	1	1	0/1	1	0/1	0/1	0/1	0/1	0/1	0/1	1			
B	1	1	1	1	1	1	1	1	1	1	1	1	0			
C	1	1	. 1	1	1	1	1	1	1	1	1	1	1			
D	1	1	0/1	0/1	1	0/1	1	0/1	0/1	1	1	1	1			
E	1	1	1	1	1	1	1	1	1	1	1	1	1			
F	1	1	1	1	1	1	1	1	1	1	1	1	1			
G	1	0	0	0	0	0	1	1	1	0	0	0	1			
H	0	0	0	0	0	0	0	0	0	0	0	1	1			

Character state codes: A, Cell C of forewing pilose all over (0), partly and sparsely pilose (0/1) or entirely glabrous (1). B, Sawsheath peg glabrous (0) or setose (1). C, Sawsheath with (0) or without (1) specialized setae. D, Area between antennal sockets with distinct pale marking (0), obscure pale marking (0/1) or without pale marking (1). E, Black area between lateral suture and upper inner orbit reduced, only obscurely defined (0), not reduced, sharply defined (1) or showing intermediate conditions between 0 and 1 (0/1). F, Antennal scape with inner surface largely pale (0) or blackish (1). G, Legs pale yellow (0) or more or less greenish (1). H, Stigma largely pale (0) or blackish (1). (–) indicates the loss or damage of the structure. Achterberg and Aartsen (1986) used characters A–G to separate *P. viridipes* from *P. albopictus*.

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stigma is quite stable all through its range. As discussed under *P. heecheonparki*, Beneš's (1976) "melanic form" from "Baikal, B. Glubokaya" may possibly belong to *P. heecheonparki*.

Host-plant. *Prunus padus* L. (Kangas, 1961; Kangas & Kangas, 1965).

Parasite. *Pnigalio monilicornis* (Zetterstedt, 1838) (Hymenoptera, Eulophidae) (Vikberg, 1982).

Remarks. This is a widespread, rather variable species. After examining the type material, I have concluded that *P. altaicus* Gussakovskij, 1935, and *P. viridipes* Achterberg & Aartsen, 1986, are synonymous with this species. The lectotype of *L. albo-picta* and the holotype of *P. altaicus* are light-colored and the holotype of *P. viridipes* is quite dark-colored, while all shades of intermediate specimens occur.

The lectotype of *L. albo-picta* (Fig. 2 E–F) is generally in good condition, except that it lacks a few apical segments on the left antenna and that the ventral side is partly soiled with dead mold. Achterberg and Aartsen (1986) stated that *P. albopictus* has the "appendage [=peg] of ovipositor sheath glabrous" and the "apex of ovipositor sheath without specialized setae" whereas their *P. viridipes* has the "appendage of ovipositor sheath setose" and the "apex of ovipositor sheath with specialized truncate setae." My examination of the sawsheath and its peg of the lectotype of *L. albo-picta*, which seem well-preserved at first sight but actually are rather dirty and at least partly damaged, has shown that 1) the peg is probably broken, smaller (shorter) than the other specimens examined and has no clearly visible setae, and that 2) there is at least one thick, apically truncate or rounded seta in the ventral part of the sheath and a few less conspicuous ones in the dorsal part. Considering also the fact that all the other specimens examined have the "*viridipes*"-type sawshaeth and peg, even though some of them are almost indistinguishable from the lectotype of *L. albo-picta* in all other respects, I should conclude that the sawsheath and its peg of Thomson's specimen have been damaged and originally had no significant differences from those of the other specimens.

The holotype of *P. altaicus* (Fig. 2 H–I) is in good state, though the entire left flagellum and apex of the right foretarsus are missing. As Beneš (1976) pointed out, Gussakovskij's holotype almost perfectly agrees with Thomson's lectotype, except for the reduction of the pale spots on frons (actually almost missing) and smaller number of the antennal segments (18 vs. 19 in Thomson's specimen). The sawsheath has some distinct specialized setae and the peg is rather large, elongate and setose. Although the differences in sawsheath and its peg between the two specimens are seemingly large, I believe they are conspecific, the differences being mainly due to the poor condition of the sawsheath of the lectotype of *L. albo-picta*.

Achterberg and Aartsen (1986) distinguished *P. viridipes* from *P. albopictus* by the glabrous costal cell in the forewing, setose sawsheath and its peg, dark color pattern of the head, presence of greenish tint in the pale coloration and the short third antennal segment. Pesarini (1990) examined an Austrian specimen of "*P. viridipes*,"

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which agreed with the original description of the species except for the pale, *albopictus*-type color pattern of the head. Table 1 shows the variation observed in the 59 specimens examined in this work for the relevant characters. The data clearly indicate that all the characters or their combinations are not so stable as to be used for separating species. As discussed already, I consider the alleged differences in the sawsheath and its peg to be due to the seemingly well-preserved but actually damaged sawsheath and its peg of Thomson's lectotype, and I believe *P. viridipes* is synonymous with *P. albopictus*.

The specimens of *P. albopictus* from Switzerland, Ukraine and Korea listed above represent the first record of this species from the three countries. The only Ukrainian specimen examined is labeled "*Pamphilius pallipes* Zett. ab. *prasinipes* m., typus, D. Dovnar det.," but I was not able to find any published descriptions of this "aberration" and regard it as an unpublished name.

Liston (1995) included Scotland in the distribution of *P. albopictus* with a question mark ("SCO?"). This is probably based on the old record of Cameron (1890), who treated this species as a variety of "*Pamphilius depressus*" and recorded it from Scotland; however, Cameron's Fig. 10 in Plate II suggests that his "*Pamphilius depressus* var. *albo-pictus*" was probably *P. varius* (Lepeletier, 1823).

The concept of *P. albopictus* here adopted has very much in common with *P. kamikochensis* Takeuchi from Japan. Adults of these two allopatric forms are distinguishable by rather small differences in coloration as shown in the key and the larvae of the two forms feed on closely related but different cherry trees of the subgenus *Padus* of the genus *Prunus*; *P. albopictus* is associated with *P. padus* (Kangas & Kangas, 1965) and *P. kamikochensis* with *P. ssiori* (Shinohara & Okutani, 1983).

One interesting difference between the two species probably exists in the form of parthenogenesis. *Pamphilius albopictus* is an uncommon but widespread species known only from the females (Viitasaari, 1982). I have examined 59 females of this species as listed above, but no males have become available in spite of my effort to find them both in museum collections and in the field. This strongly suggests that *P. albopictus* should reproduce thelytokously or, at least, the sex ratios are extremely female-biased. *Pamphilius kamikochensis*, on the other hand, is a normal arrhenotokous species as evidenced by the number of the available specimens (355 females and 357 males). Gauld and Hanson (1995) indicated that thelytokous species could be geographically widespread in comparison to their arrhenotokous relatives. The wide distributional range of *P. albopictus* and the comparatively narrow range of *P. kamikochensis* may be a good example showing such a relationship.

Pamphilius kamikochensis Takeuchi, 1930

(Figs. 3 A–D, 5, 7 E, 8 D–F, 9 D–F, 10 B, D)

Pamphilius kamikochensis Takeuchi, 1930, p. 14; Takeuchi, 1938, p. 224; Takeuchi, 1955, p. 114, pl. 51,

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fig. 756; Beneš, 1976, p. 173; Shinohara & Okutani, 1983, p. 278.

Female (holotype; Figs. 3 A–B, 5 A–B, 7 E). Length ca. 9.5 mm. Head black, with the following pale yellow: most of clypeus, broad postocular stripe posteriorly reaching hind margin of head and anteriorly extending along inner orbits to dorsal half of malar space (interrupted at middle of inner orbit and not connected to clypeal pale area), oblong spot along outer margin of each lateral suture, ventral half of gena (except for narrow ventral margin); mandible pale yellow, with inner half black and apex rufous; antenna blackish brown, with outer surfaces of three basal segments pale yellow to brown; ventral surface of the remaining flagellum slightly paler than dorsal surface. Thorax black with the following pale yellow: ventral half of lateral pronotum, broad posterolateral corner of dorsal pronotum, large spot on ventral surface of cervical sclerite, tegula, posterior half of mesoscutal median lobe, mesoscutellum, very large spot covering most of lateral part of mesepisternum, metascutellum, most of lateral part of metepisternum, obscure spot on metepimeron. Legs pale yellow, with narrow coxal bases black. Wings hyaline; stigma dark brown; veins in forewing dark brown, with entire C, Sc, and veins in its basal part very pale brown. Abdomen black, with narrow median part of 2nd and large median parts of 3rd to 5th terga orange, and very narrow lateral margins of dorsal surface, posterior margins of 8th and terminal terga, all laterotergites, posterior 1/3 of 2nd and posterior 1/2–3/4 of each of the remaining sterna, and caudal part including sawsheath pale yellow; median parts of 6th to 8th terga obscurely marked with blackish brown.

Upper frons below ocelli roundly weakly convex, without distinct median notch reaching median fovea; ocellar basin shallow and inconspicuous, represented by shallow furrow around median ocellus, without distinct anterolateral extension; median fovea indistinct; frontoclypeal crest low, rounded, in lateral view, distinctly lowered at frontoclypeal suture; facial crest low, rounded. Upper part of head behind transverse and lateral transverse sutures with rather sparse, irregular, often large and deep punctures, interspaces rather smooth; area from these sutures to dorsal halves of paraantennal field and frons covered with very dense, coarse, deep, rugosely confluent punctures; ventral part of paraantennal field rather smooth or weakly coriaceous, nearly impunctate; ventral part of frons and all clypeus covered with rather dense, deep, large punctures, interspaces smooth or weakly coriaceous; malar space and gena rugose and irregularly punctate; head before crassa pilose all over. Antennae 21-segmented, with 3rd segment about 2.0 times as long as 4th. Tarsal claw with rounded basal lobe and inner tooth distinctly shorter than outer one. Forewing with cell C sparsely pilose. Sawsheath as in Fig. 8 D–F, with stout, apically truncate or rounded setae ventrally; peg subconical, slightly bent above, setose.

Male (allotype, Figs. 3 C–D, 5 E–F). Length ca. 9 mm. Head black, with anterior part before line connecting facial crests, most of frons, broad postocular stripe, malar space and most of gena (except for broad posterior margin and dorsal part)

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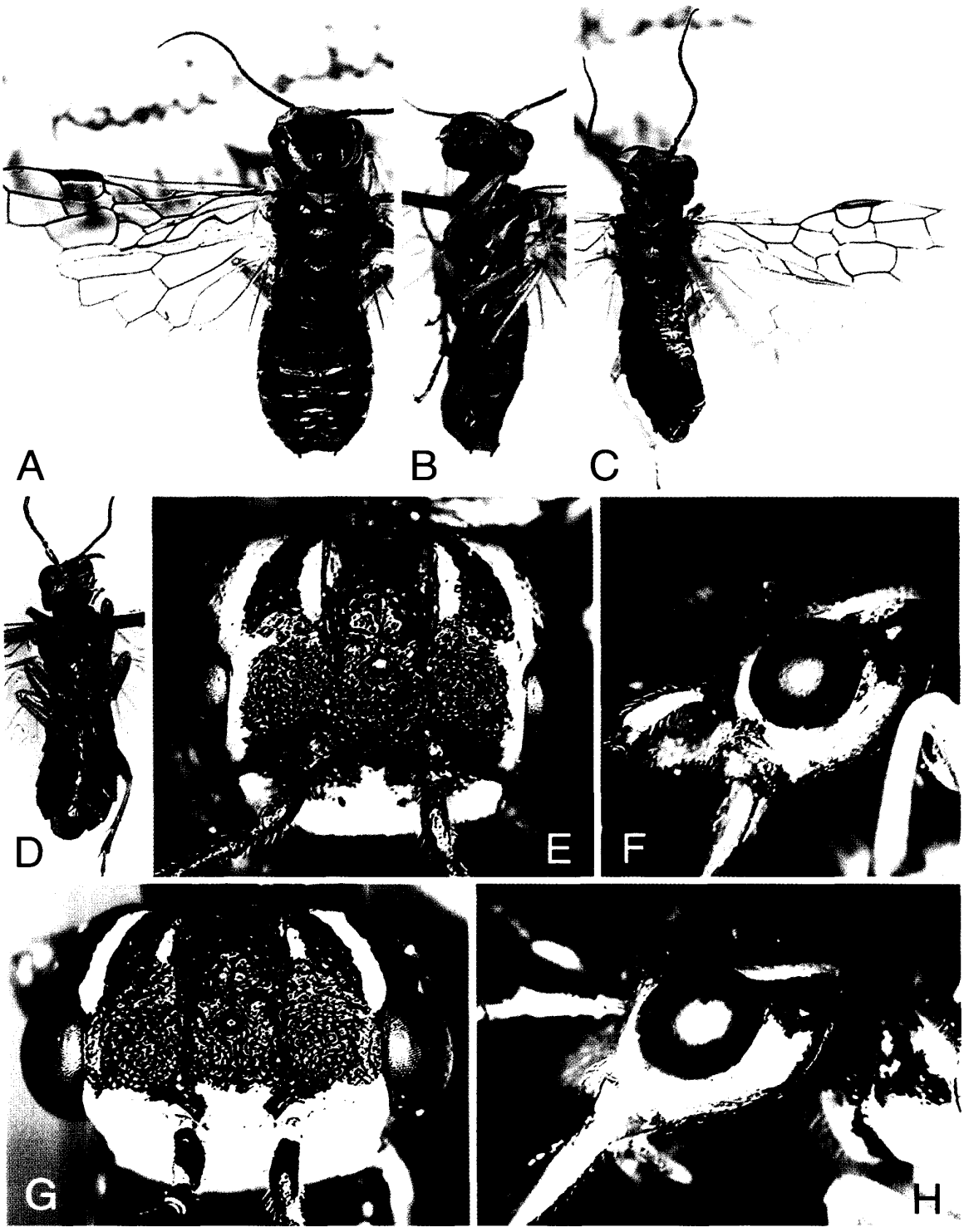

Fig. 3. Type specimens of *Pamphilius* spp. —— A–B, *P. kamikochensis* Takeuchi, ♀, holotype; C–D, do., ♂, allotype; E–F, *P. heecheonparki* sp. nov., ♀, holotype, head; G–H, do., ♂, paratopotype, head.

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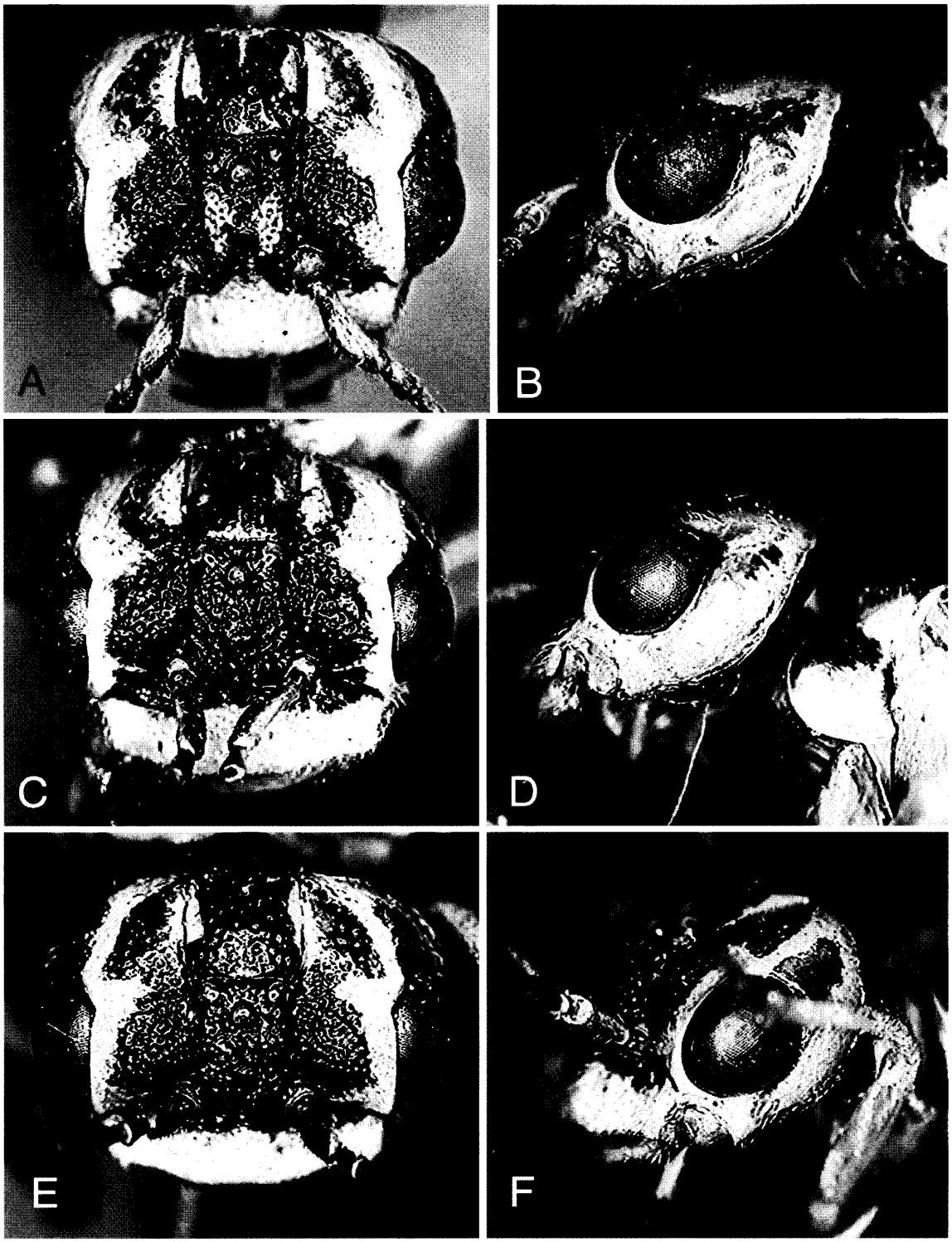

Fig. 4. *Pamphilius albopictus* (Thomson), ♀, head. —— A–B, lectotype of *Lyda albo-picta* Thomson; C–D, holotype of *P. altaicus* Gussakovskij; E–F, holotype of *P. viridipes* Achterberg & Aartsen.

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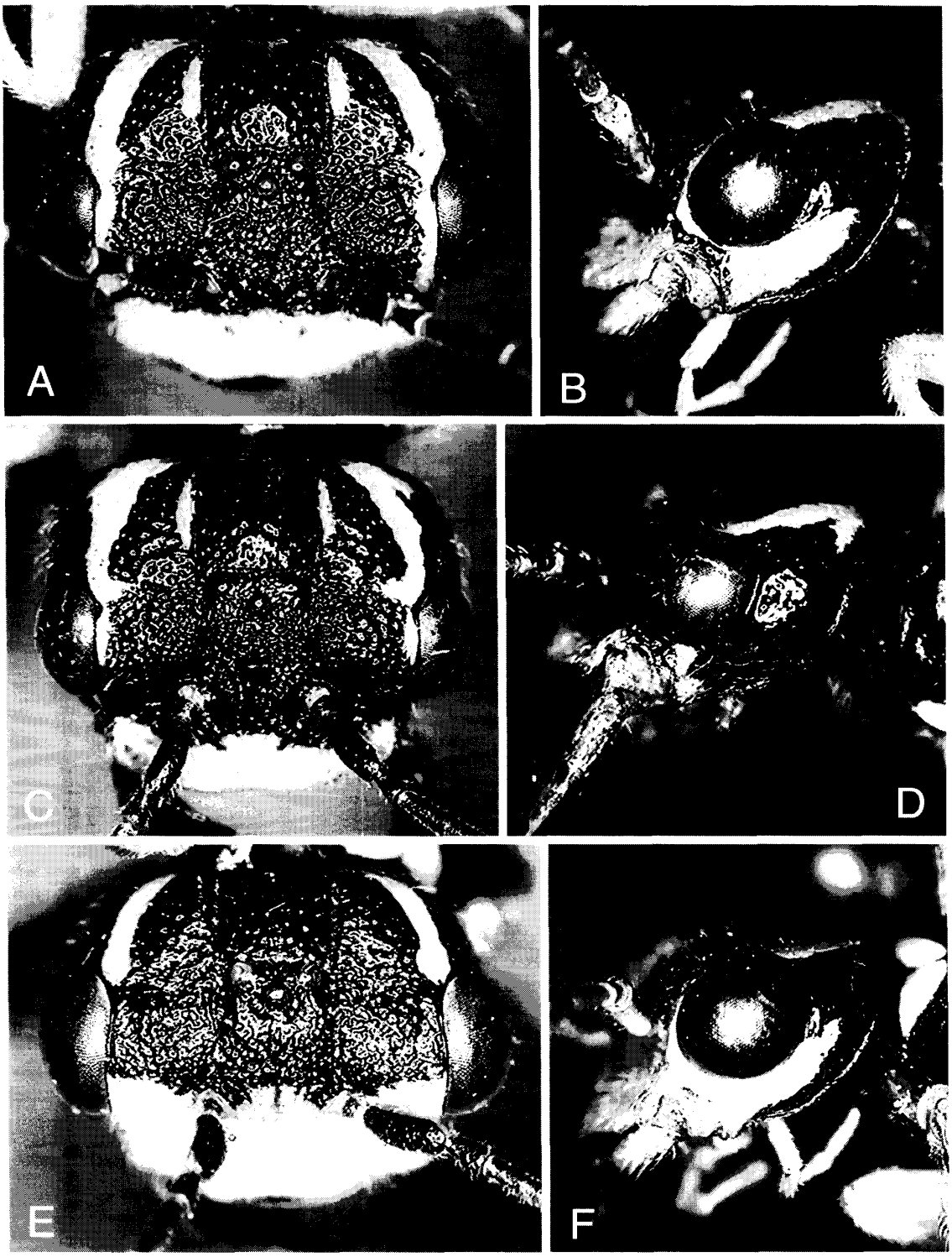

Fig. 5. *Pamphilius kamikochensis* Takeuchi, head. —— A–B, ♀, holotype; C–D, ♀, dark specimen, Sapporo; E–F, ♂, allotype.

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pale yellow; mandible largely black, broad outer surface pale yellow and apex rufous; antennal scape and pedicel black, with outer ventral surfaces pale yellow, and flagellum pale brown, dorsally and apically blackish. Thorax black with the following pale yellow: ventral part of lateral pronotum, posterolateral corner of dorsal pronotum, ventral part of cervical sclerite, tegula, posterior half of mesoscutal median lobe, mesoscutellum, entire lateral surface of mesepisternum and large subtriangular spot on each side of pseudosternum, very narrow posterior margin of mesepimeron, metascutellum, entire lateral surface of metepisternum, very narrow posterior margin of metepimeron. Legs and wings as in female, but stigma brown (paler than in female) with broad anterior and posterior margins distinctly darkened. Abdomen black dorsally, with narrow lateral margin pale yellow, narrow subtriangular spot at posterior margin of 2nd segment and large median spot on each of 3rd to 6th segments orange, and rather broad posterior margins of 7th and 8th segments pale yellow, and yellow ventrally, with base of 2nd sternum and anterolateral corners of each sternum more or less black.

Structure similar to that of female, but frons more strongly convex and facial crest slightly more developed, bluntly carinate. Antennae 20-segmented, with 3rd segment about 1.9 times as long as 4th. Forewing with cell C sparsely pilose all over. Subgenital plate with apical margin rounded. Genitalia as in Figs. 9 D–F, 10 B, D.

Distribution. Japan (Hokkaido, Honshu).

Type specimens examined. ♀ (holotype) labeled "9. VI. 1929, Kamikochi, Takeuchi," "*Pamphilius kamikochensis* Take., Holotype" (UOP); 4♀, 4♂ (allotype and paratypes), same data as for holotype (UOP).

Other specimens examined. **Hokkaido**: 1♀, Futamata, Kita-hiyama, Hiyama, 11. VI. 1984, A. Shinohara; 1♀, Nakayama-toge, 800 m alt., Shiribeshi, 27. VI. 1987, A. Shinohara; 3♀, 4♂, same locality and collector, 26. VI. 1991; 4♀, 10♂, same locality and collector, 27–30. VI. 1992; 2♀, 13♂, same locality and collector, 22. VI. 1996; 2♀, 3♂, same locality and collector, 8. VII. 1996; 1♂, same locality and collector, 20. VI. 1997; 1♀, 3♂, same locality and collector, 26. VI. 1997; 1♂, Hayakita, Iburi, 25. V. 1988, H. Hara; 1♀, "Sapporo, H. Yaku / Maruyama 3/VI 1929," "*Pamphilius kamikochensis* Takeuchi, det. Takeuchi" (HU); 1♀, "Hokkaido, K. Igarashi / Maruyama 30/V 1930" (HU); 3♀, 18♂, Botanical Garden, Sapporo, Ishikari, 4. VI. 1982, A Shinohara; 1♀, "Hokkaido, C. Watanabe / Nopporo, 29/VI 1943" (HU); 1♀, Mt. Soranuma, Sapporo, 7. VI. 1985, M. Abe (MA); 1♀, "Bibai, Hokkaido, 17. III. 1997, H. Hara", "Coll. 25. VI. 1996 in larval stage, matured 3. VII. 1996, em. 17. III. 1997", "Host: *Prunus ssiori*"; 4♂, Bibai, Sorachi, 29. V. 1996, H. Hara; 1♂, Uryu, Shokanbetsu, Sorachi, 14. VI. 1986, A. Shinohara & H. Hara; 1♂, Mt. Yubaridake, Sorachi, 13. VI. 1986, A. Shinohara & H. Hara; 2♀, 2♂, Nukabira, 600–700 m alt., Tokachi, 16–22. VI. 1979, A Shinohara; 1♂, same locality and collector, 8. VII. 1980; 1♂, same locality and collector, 16–21. VI. 1982; 1♂, Yamada-onsen, 800 m alt., Tokachi, 21–25. VI. 1992, A Shinohara; 1♂, Horoshika-toge, 1100 m alt., Tokachi, 21–25. VI.

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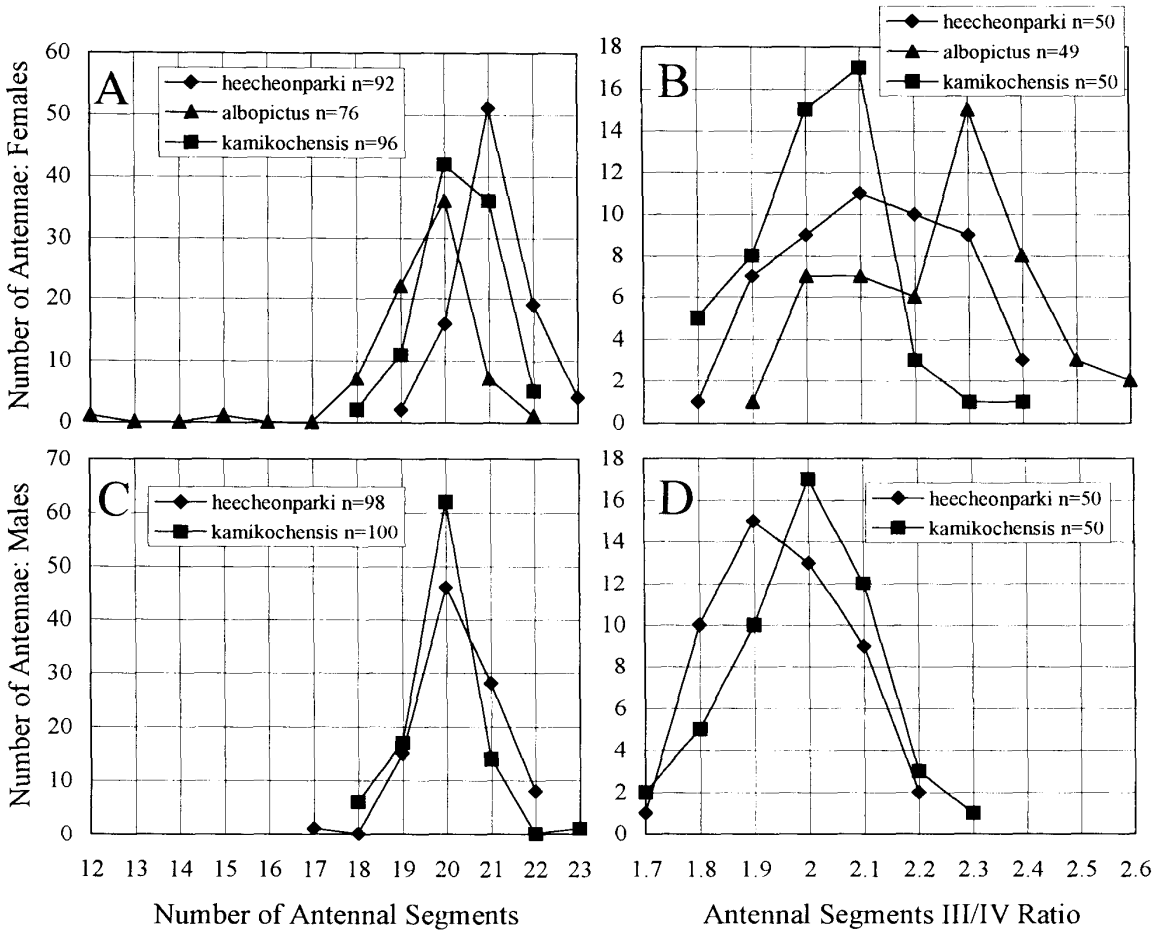

Fig. 6. Frequency distribution in the number of the antennal segments (A, C) and the ratio of the lengths of 3rd to 4th antennal segments (B, D) in the females (A–B) and males (C–D) of the three species of the *P. albopictus* subgroup.

1997, A Shinohara; 1♀, 13♂, Mt. Mokotoyama, Abashiri/Kushiro, 20. VI. 1992, A Shinohara & H. Hara; 2♂, Shibecha, Kushiro, 17. VI. 1985, M. Abe (MA); 2♂, Mt. Rausudake, Shiretoko, Abashiri/Nemuro, 23. VI. 1967, T. Naito (KU). **Honshu**: Aomori Pref.: 1♀, 1♂, "Hayaseno (Ohwani), 1985 May 18, M. Yamada"; 1 ♂, "(Mt. Bonzyu), Namioka, Aomori, 29–V, 1983, M. Yamada leg." Tochigi Pref.: 1♂, Yumoto, 1500 m alt., Nikko, 14. VI. 1971, A Shinohara; 121♀, 8♂, same locality and collector, 5. VI. 1977; 36♀, 2♂, same locality, 5. VI. 1977, N. Matsuba; 6♀, same locality, 26. VI. 1977, A. Shinohara; 3♀, 20♂, same locality and collector, 10. VI. 1978; 57♀, 173♂, same locality and collector, 1. VI. 1988; 2♀, 1♂, Kotoku–Yumoto, Nikko, 10. VI. 1972, A. Shinohara; 4♀, 9♂, same locality, 9. VI. 1973, A. Shinohara; 1♀, 2♂, same locality, 9. VI. 1973, H. Someya; 2♀, 27♂, Konseizawa, 1600 m alt., Nikko, 1–4. VI. 1971, Ishikawa & Kachi; 11♀, Chuzenji, Nikko, 16. VI. 1974, A. Shinohara; 9♀, 1♂, same locality, 4. VI. 1977, A. Shinohara; 2♀, same locality, 4. VI. 1977, N.

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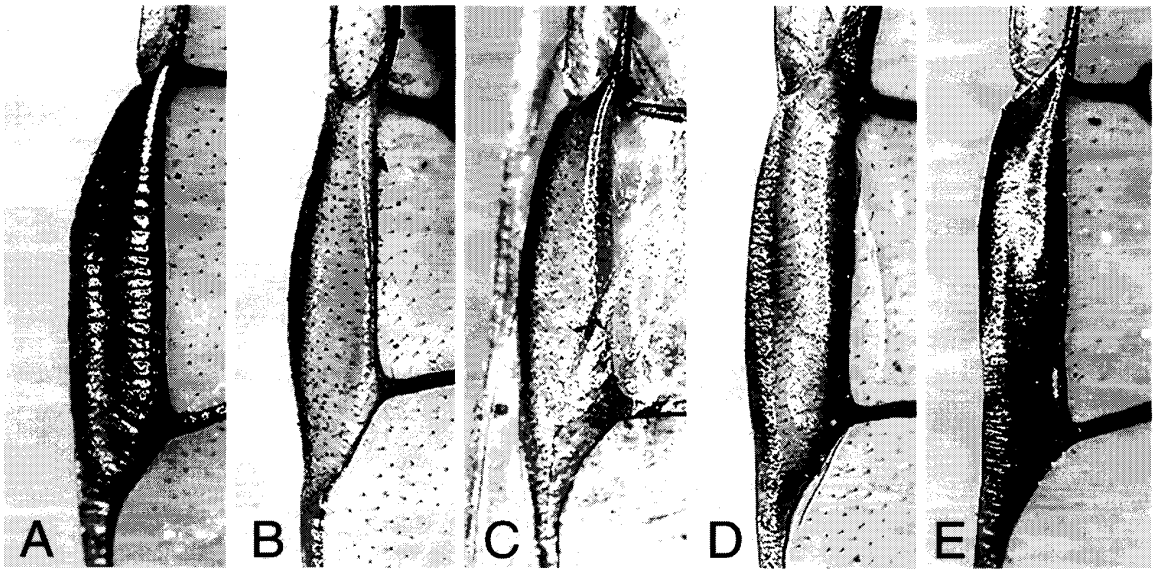

Fig. 7. *Pamphilius* spp., ♀, stigma. —— A, *P. heecheonparki* sp. nov., holotype; B, *P. albopictus* (Thomson), lectotype of *Lyda albo-picta* Thomson; C, do., holotype of *P. altaicus* Gussakovskij; D, do., holotype of *P. viridipes* Achterberg & Aartsen; E, *P. kamikochensis* Takeuchi, holotype.

Matsuba. Nagano Pref.: 1♂, Makuiwa, 1600 m alt., Shiga-kogen, 2. VI. 1985, A. Shinohara; 1♂, Shichimi-onsen, 4–5. VI. 1988, A. Shinohara; 1♀, "Nagano, Yamada, 2620. 5. 26"; 1♀, 44. 5. 30, Kamikochi, *Pamphilius pallipes* Zetterstedt"; 12♀, 1♂, Kappabashi–Myojin, Kamikochi, 21–23. VI. 1989, A. Shinohara; 1♀, "14. VII. 1924, Yarisawa, Shimano, Japan," "N. Tosawa collection, June 1978" (OMNH); 4♀, Tokugo-toge, Kamikochi, 27. VI. 1976, A. Shinohara; 1♂, Shimashima-dani, 23. VII. 1968, A. Shinohara; 1♀, same locality, 26. VII. 1969, A. Shinohara; 2♀, same locality, 1700 m alt., 29. VI. 1976, A. Shinohara; 1♂, Shimashima, 16. V. 1984, A. Shinohara; 17♀, same locality, 23. V. 1985, A. Shinohara; 10♀, 18♂, same locality, 10. V. 1989, A. Shinohara; 1♂, Sanjiro, Utsukushigahara, 28. V. 1985, A. Shinohara; 19 ♀, Tobira-onsen, 26–31. V. 1985, A. Shinohara; 1♀, Akadake-kosen, 2100 m alt., Yatsugatake Mts., 24. VII. 1970, A. Shinohara. Yamanashi Pref.: 1♂, Masutomi, Sudama, 18. VI. 1987, S. Takeda.

Variation. Females: Length varies from 8 mm to 11 mm. The 96 intact antennae examined have 18 to 22 segments (Fig. 6 A). The ratio of the lengths of the 3rd to 4th antennal segments in 50 specimens measured varies from 1.8 to 2.4 (Fig. 6 B). Variations in color pattern are noted in the key. Males: Length varies from 8 mm to 10 mm. The 100 intact antennae examined have 18 to 21 (one exceptionally 23) segments (Fig. 6 C). The ratio of the lengths of the 3rd to 4th antennal segments in 50 specimens measured varies from 1.7 to 2.3 (Fig. 6 D). A pale oblong spot sometimes occurs along the outer margin of the lateral suture. The lateral lobe of the mesoscu-

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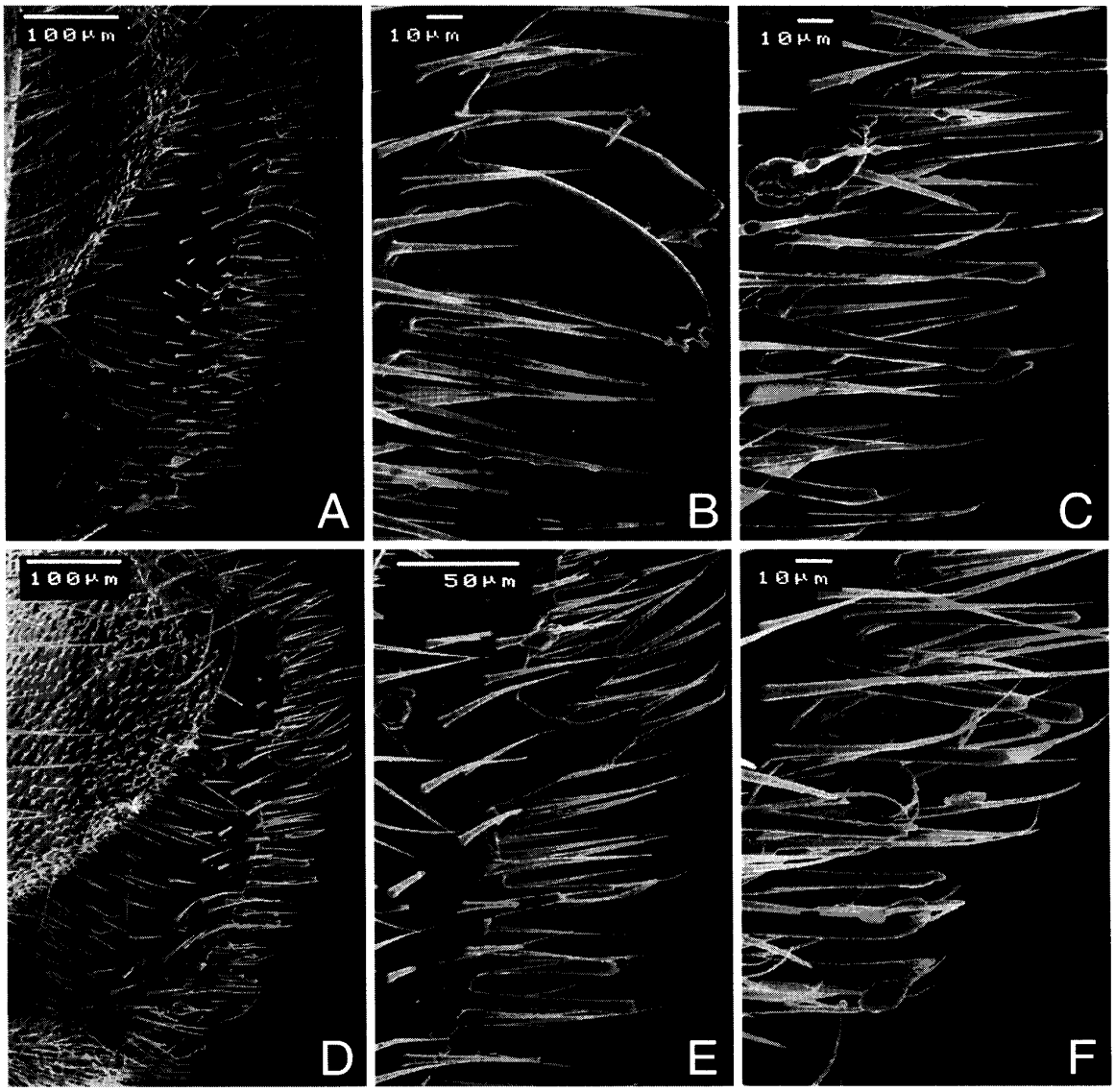

Fig. 8. *Pamphilius* spp., ♀, sawsheath, lateral view (A, D), median part including peg (B, E), ventral part showing specialized setae (C, F). —— A–C, *P. heecheonparki* sp. nov., paratopotype; D–F, *P. kamikochensis* Takeuchi, Nikko.

tum is always entirely black. The pseudosternum is sometimes marked extensively with pale yellow, but black area always remaining along posterior margin. The abdominal orange pattern shows large variation, though most of the specimens are similar to the allotype described above. In some darkest specimens, the orange marking on the abdomen is totally missing, whereas in the palest specimen examined (from the Yatsugatake Mountains, central Honshu), the 2nd to 6th terga are mostly orange dorsally.

Host-plant. *Prunus ssiori* F. Schmidt (Shinohara & Okutani, 1983; see discussion below).

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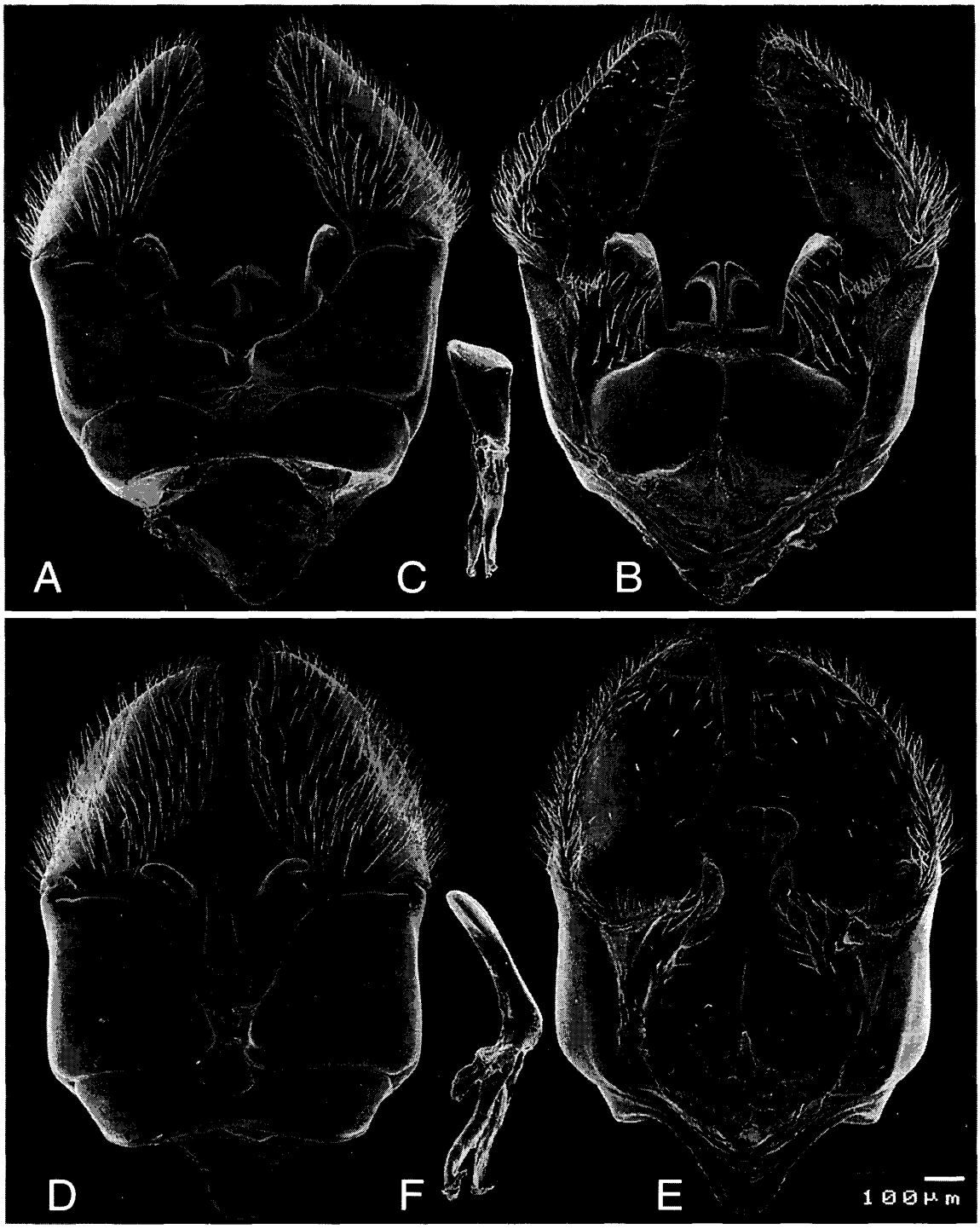

Fig. 9. *Pamphilius* spp., ♂, genitalia, dorsal (A, D) and ventral view (B, E) and penis valve, lateral view (C, F). —— A–C, *P. heecheonparki* sp. nov., paratopotype; D–F, *P. kamikochensis* Takeuchi, Nikko. All to the same scale.

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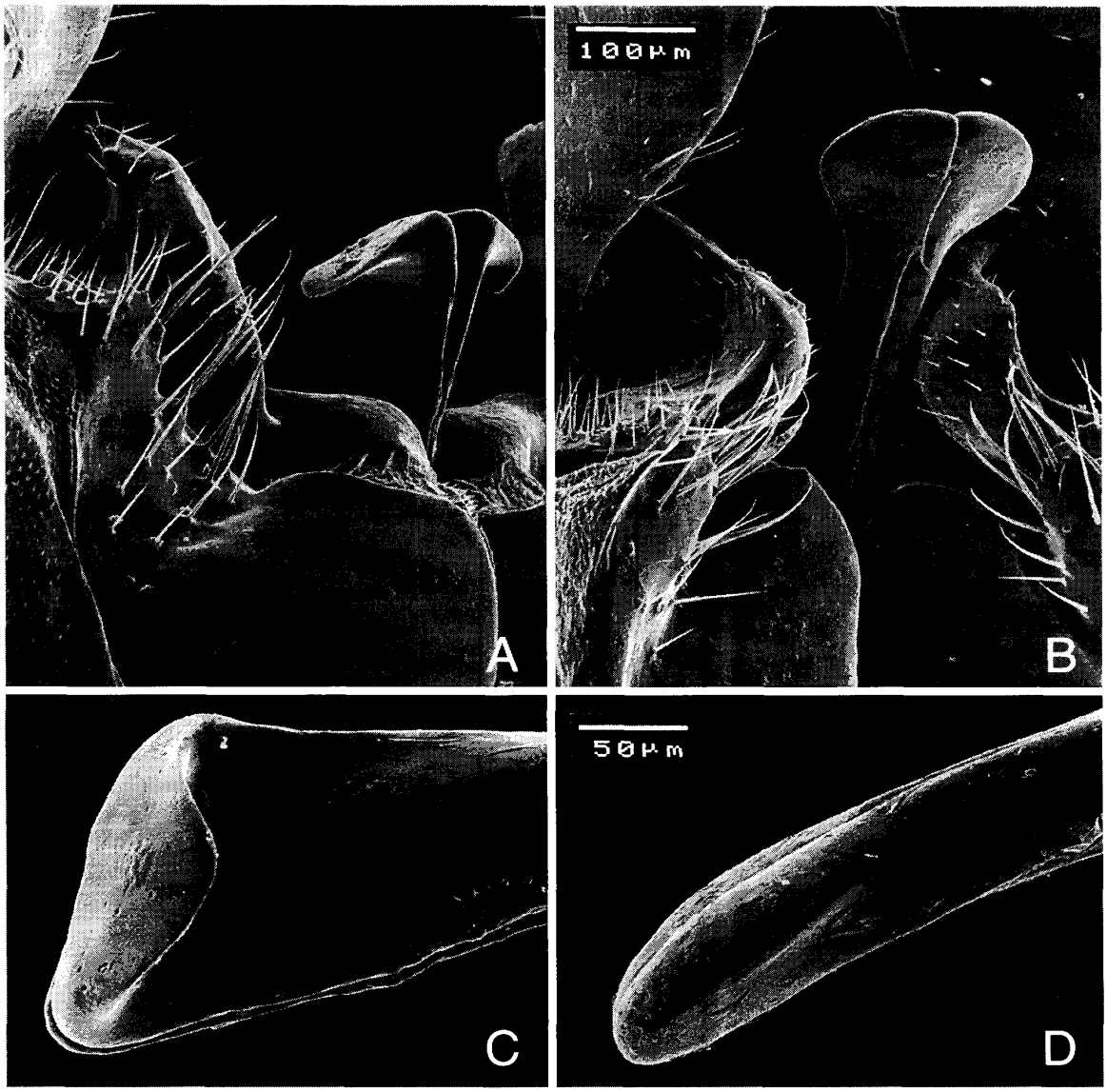

Fig. 10. *Pamphilius* spp., ♂, genitalia, apical part of volsella and valviceps, ventrolateral view (A–B) and valviceps, lateral view (C–D). —— A, C, *P. heecheonparki* sp. nov., paratopotype; B, D, *P. kamikochensis* Takeuchi, Nikko.

Remarks. This species is very closely allied to *P. albopictus*, as discussed above. It is distinguished from the other Japanese congeners by the color pattern and punctuation of the head, shape of the clypeus, rather short 3rd antennal segment, coloration of the abdomen, presence of the specialized setae on the sawsheath, the subconical setose peg, and the elongate, apically roundly widened penis valve.

Of the characters used by Beneš (1976) to distinguish *P. kamikochensis* from *P. albopictus*, the shape of the head, length of the antenna, number of the antennal segments, and the shape of the stigma are rather variable and thus not useful.

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This is usually an uncommon species, but Shinohara and Okutani (1983) reported on a case of mass occurrence at Yumoto, Nikko, in central Honshu. The same authors gave *P. ssiori* as a host-plant of this species based on the observation of oviposition and young larvae. Dr. H. Hara of the Forestry Research Institute, Bibai, has recently succeeded in rearing this species from a larva feeding on *P. ssiori* to the adult (data are given in the specimens examined section above). This is the first host-plant record based on successful rearing.

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